FIT FOR A CADET

Those Unique Springfield Armory Cadet Firearms and Bayonets

by David H. Hanes

Abstract

Shortly after the inception of the United States Military Academy at West Point in 1802 it became apparent that the Corps of Cadets,[1.] most of whom had not yet reached physical maturity, were encumbered and perhaps intimidated by the unwieldy standard issue infantry musket of the day. Attempts by the National Armory at Springfield, Massachusetts[2.] to provide cost-effective alterations to existing arms already in inventory had less-than-desirable effects. As a result, in 1830 the Springfield Armory began scaling down the size of the standard infantry arm and for over sixty years produced a series of sui generis firearms and bayonets for cadet use.

Figure 1. West Point, from Phillipstown (1831). Engraving by W. J. Bennett showing the original buildings of the United States Military Academy.

Introduction

In the modern era there is little concern that a military academy cadet might be overburdened by his or her training firearm. Cadets at the Academy today use two distinct firearms: the M14 Rifle, which lends itself well for drill and ceremonial use, and the nimble M4 Carbine, an M16 Rifle derivative, for maneuver and marksmanship training – and it is this gun they may eventually carry into combat. That a cadet's drill weapon is larger than his battle weapon is antithetical to the situation 200 years ago. When West Point opened as a military academy in 1802, the standard infantry firearm was the Charleville Pattern flintlock musket.[3.] Produced at both national armories and by various contractors, it was .69 caliber, about 60 inches long, and weighed over nine pounds. Add a bayonet and put it in the hands of a 66-inch tall cadet who weighed just 130 pounds and one can clearly appreciate the mismatch of this integrated man-machine weapon system.

A curious human growth phenomenon accompanied the American Antebellum Period.[4.] During this era, rapid population growth and attendant urbanization outpaced the production and availability of protein and other nutrient-based farm products. Because of this, the physique of the average male was actually declining. This trend would continue until the 1880's, when improvements in farm output, shipping processes, and infrastructure finally allowed rural supply to meet urban demand. Perhaps more important for this discussion, in the antebellum period physical growth did not peak near age eighteen as it does today. Growth continued until about age twenty-one, meaning most cadets did not reach physical maturity until near the end of their military academy tenure.[5.] Another factor exacerbating this stature differential between first-year cadets and their ultimate stature as adults was, of course, starting age. If physical maturity did not occur until age twenty-one, but one entered the Academy at age fourteen, then significant growth change would be expected.

While this gradual downtrend in stature resulting from nutritional intake deficiencies may have escaped notice by social scientists of the day, the immediate situation was obvious to those commissioned to run the Academy. Sixteen-year old cadets born in 1840 (for example) averaged 5 feet 5 inches, compared to twenty-one year old cadets (or the stature one would expect of a mature soldier) who stood 5 feet 8 inches.

The nascent Academy did not employ reduced-size arms, at least not officially, and certainly none were specifically manufactured or modified for cadet use in that first decade. References to cadet guns are scant in any period, but almost nonexistent in the early years of West Point. Cadets almost certainly were issued the standard Charleville Pattern infantry arm, but it appears that some attempts were made to find existent smaller arms to outfit the Corps. One respected secondary source tells of French "musketoons" being procured in 1802, indicating the desire to outfit cadets with a smaller firearm goes back to the beginning, but no further information is given beyond their aversion to them.[6.] Also, a few references to "carbines" can be found, but no further identity is given. The lack of official terminology in correspondence serves only to obfuscate what guns were used by cadets at this time.

The National Armory at Springfield

The U.S. Springfield Amory in Springfield, Massachusetts (Figure 2) was one of two national armories established by Act of Congress in 1794, the other being at Harpers Ferry, Virginia. Already an established arsenal that stored and repaired arms during and after the American Revolution (1776-1783), Springfield Armory was the first government establishment to manufacture

Author's Note: Firearms and bayonet dimensions given throughout this text are single data points taken from the author's collection and are consistent with published secondary sources listed in the bibliography. Inspector stamps, where encountered, are also consistent with published sources but readers are encouraged to consult the literature to obtain a more comprehensive picture of other marks that may be observed. All firearm and bayonet photos are by the author, and from the author's collection.

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new firearms (1795) and the last to discontinue their manufacture (1968).[7] Neither Harpers Ferry nor private contractors produced cadet arms. During the 63-year period when reduced-size cadet guns and bayonets were manufactured (1830-1893), Springfield Armory alone produced these arms.

Figure 2. Springfield Armory c.1850 (Springfield Armory National Historic Site photo).

The Antecedents of the Cadet-designated Models

By the second decade of the Academy, active attempts were made to mitigate the ungainly characteristics of the standard infantry firearm - first by altering existing arms in inventory, then by fabricating a "short musket" based on the current standard infantry issue. Between 1813 and 1818 three arms are known to have been produced or altered for West Point use; they are: 1) the Springfield Charleville Pattern alteration with barrel cut down to 33-inches, 2) alteration of the so-called "Indian Carbine" with the addition of sling swivels (and in 1830, added bayonet lugs), and 3) the "Short Musket" for Artillery and Cadet use made in 1817-1818.

Springfield Charleville Pattern with 33-inch Barrel

Figure 3. A Charleville Pattern musket that was originally equipped with a soldered-on bayonet and subsequently cut down to 33 inches in the 1813 alteration program at Springfield Armory. Note the "Brown Bess" method of upper sling swivel attachment. These were thought to be among the first of the reduced-size guns that went to West Point.

In late-1812 and early 1813 the problem of what to do with almost 14,000 Charleville Pattern muskets still equipped with soldered-on bayonets was finally addressed. These arms were manufactured in the early 1800's at Springfield, and what began as an experiment to prevent waste resulted in an exhibition of waste. The thought that bayonet loss could be mitigated by permanently affixing them to their muskets was a good idea that didn't work, for these cumbersome arms were soon demoted to storage at Springfield Armory, where they lingered for many years. Even when the United States was fully engaged in war against Britain, relatively few were distributed to the troops, as they were "unfit for service in their present state."[8]

Figure 4. Lock of the Charleville Pattern musket shown in Figure 3.

Left rusting in storage and bound for obsolescence, Secretary of War John Armstrong (1813-1814) ordered Springfield Armory Superintendent Benjamin Prescott (1805-1813) to remove the soldered-on bayonets of these early Charleville Pattern Springfield muskets. This was accomplished by cutting about twelve inches off the barrel from the muzzle end, resulting in a 32- to 33-inch barrel (Figure 3, 4). The forestock was modified accordingly to allow for a socket bayonet, while the middle barrel band was eliminated and the upper band moved back. Lacking a proper perch for the upper sling swivel, a mounting lug was installed on the barrel between the two bands, and the sling swivel installed English-style with a screw through the stock and barrel lug (Figure 5). A bayonet lug was then added, and bayonets fitted.

Figure 5. Upper sling swivels attached in the "Brown Bess" style on the 33-inch barrel Charleville Pattern musket (A) and on the early 2-band 36-inch barrel "Short Musket" (B).

On 8 December 1813 Armstrong instructed Prescott to send three hundred of these shortened muskets to Captain Partridge at West Point, "for the use of the Cadets of the Military Academy."[9] This may be the only known use of these 33-inch barrel muskets, as the remainder appear to have remained in storage for a few more years until sold to a private contractor in late 1815.[10] However, on 15 January 1815, Jonathan Morton of West Point complained to Springfield Armory Superintendent Colonel Roswell Lee (1815-1833): "The Cadets have objected to these Arms, preferring Carbines."[11]

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Manufactory: .....*Springfield Armory*

Ignition system: .....*Flintlock, muzzleloader*

Caliber, bore: .....*0.69, smoothbore*

Barrel Length: .....*32.50 inches*

Overall Length: .....*47.06 inches*

Standard Issue Infantry Firearm (length):[12] .....*Charleville Pattern Musket; (59.50 inches)*

Quantity Produced:
Several thousand were cut down as described; only 300 were known issued for service, most or all of them sent to West Point.

Variations: .....*None*

Identifying features of author's firearm example:
Two barrel bands with upper sling swivel attached English-style (Figure 5). Lockplate dated 1805, butt plate dated 1805. The left barrel breech is stamped with a "P"/ eagle head / "V". Original flintlock configuration.

Obtainability: .....*Very rare*

Springfield Carbine for Indians[13.]

In two letters dated March 1807, Secretary of War Henry Dearborn (1801-1809) instructed Benjamin Prescott to manufacture 1,200 small muskets for the Indian Department (Figure 6, 7). They were specified by Dearborn in some detail:[14.]

> The length of the barrel should not exceed two feet ten inches; and its ball suited to a caliber weighing half an ounce; the mounting to be brass, including the sight, with a thumb piece. The stock to be secured not by bands or slides but in old the usual manner; the end of the stock, at the muzzle to have a small brass ferule or hoop around it to prevent its splitting; the lock to be light and plain…

Figure 6. A Springfield Armory "Carbine for Indians." With an "1809" dated lock and "1810" dated barrel tang, this musket did not undergo any of the cadet upgrades described in the text. However, a demand for smaller firearms does not discount the possibility that some unmodified muskets may have been used at West Point. This example was altered to percussion during its period of use.

Few, if any, of these carbines were ever issued to Indians. A request from West Point Superintendent Captain Alden Partridge (1814-1817) for a lighter firearm resulted in an unknown number of carbines being modified in 1814 by adding sling swivels. The upper swivel was attached by means of a screw through the forestock in the English fashion, the lower swivel attached to the underside of the buttstock. These modified carbines were sent to West Point along with the cut-down, 33-inch barrel, Charleville Pattern musket. There is no evidence that unaltered Indian carbines were sent, but earlier references to "carbines" imply they may have been used at West Point prior to alteration.

Another alteration, done much later to approximately 321 carbines (1830-1832), involved shortening the forestock to allow for the attachment of a socket bayonet. A bayonet lug was added by two different methods: one on top of the barrel integral with the front sight, and the other below the barrel utilizing the barrel retaining pin lug. Despite their dislike for the 33-inch barrel Charleville Pattern musket, cadets also disliked the Indian Carbine, but by this time the manufacture of the Model 1830 Cadet Musket was authorized.[15.]

Figure 7. Lock of the Indian Carbine shown in Figure 5.

Manufactory: .....*Springfield Armory*

Ignition system: .....*Flintlock, muzzleloader*

Caliber, bore: .....*0.54, smoothbore*

Barrel Length: .....*33.75 inches*

Overall Length: .....*48.56 inches*

Standard Issue Infantry Firearm (length): .....*Charleville Pattern Musket; (59.50 inches)*

Quantity Produced:
Approximately 1,201 were initially made between 1809-1810. An unknown quantity had sling swivels installed in 1814; approximately 321 were altered for bayonets in 1830-32.

Identifying features of author's firearm example:
Lockplate dated 1809; butt plate tang dated 1810. The left barrel breech is stamped with a "P"/ eagle head / "V", a large "US" is stamped on top of the barrel. A "US" in script appears on the left stock flat. The sling swivel addition and provisions for bayonet were not done on this firearm. Percussion alteration performed during its period of use.

Variations: .....*As noted above.*

Obtainability: .....*Very rare*

Figure 8. This very rare 2-band, 36-inch barrel "Short Musket" is one of 200 made at Springfield Armory and subsequently sent to West Point, but the design fell short of the envisioned cadet gun concept. Like the 33-inch Charleville (Figure 3), the upper sling swivel is also attached in the English fashion. Originally a flintlock, this example was later upgraded at Springfield Armory to the cone-in-barrel percussion alteration.

Short Musket for Artillery or Cadet Use[16.]

With the failure on two previous attempts at creating a cadet-friendly musket, Captain Partridge appealed to Colonel Decius Wadsworth, the first head of the U.S. Army Ordnance Department (1812-1821). It is interesting that, what Wadsworth requested of Springfield Armory Superintendent LTC Roswell Lee (1815-1833), and what resulted, is not what Partridge wanted – he received a firearm nearly identical to the "too-heavy" 33-inch barreled Charleville Pattern musket but with a longer 36-inch barrel![17.]

Ordnance Office Jany 29, 1817

Lieut Col. Lee

Dr Sir.

I have received a Letter from Capt. Partridge having charge of the Cadets at the Military Academy at Westpoint, stating the Standard Muskets are too heavy in general for the Cadets at that Post, and wishing to have some shorter made for the purpose.

I have sometimes past had in Contemplation an consignment of that nature, in order to save such of the Barrels as may burst or prove defective near the muzzle. I should like to have a few Muskets made with Barrels just three feet long, but I would not have more than ten in a hundred Short Muskets fabricated at all events, nor more made than may take up the Barrels which prove too short for Standard Muskets. These Short Muskets may for distinction sake be named Artillery Muskets.

Capt. Partridge wants to have the Muskets made considerably lighter than the Standard Muskets, which I do not agree to. I wish the Short Muskets to be made of the same Pattern in every respect except length of Barrel & Ramrod as the Standard Musket, however it may not be amiss to choose the Locks with lighter Springs and the lighted Bayonets. Two hundred such Muskets are now wanted at Westpoint and you may get them up as fast as you have Barrels to answer.

(The letter continues, describing how to attach the sling swivels)

Respectfully I am Sir

Your very overt Servt

DECIUS WADSWORTH

Col. of Ordnance

To fulfill Captain Partridge's request for a lightweight musket for cadet and artillery use, a 36-inch barrel musket was produced by the expedient of using existing components (Figure 8, 9). The first of these muskets were those in 2-band configuration, (the modern term, "Model 1817, Type I"). Note that Colonel Wadsworth designated this model as the "Artillery Musket," even though the initiative to build this musket appears to have begun with Partridge's request for a cadet arm. Eventually these muskets would be produced by both Springfield and Harpers Ferry Armories as the so-called, "Model 1817, Type II," but records indicate that only the first 200 Springfield-made muskets were sent to West Point. These first 200 are very unique in that they are a 2-band version and also have the upper sling swivel applied in the English style (Figure 5). Later versions of this would be the traditional 3-band style with the upper sling swivel attached to the middle band.

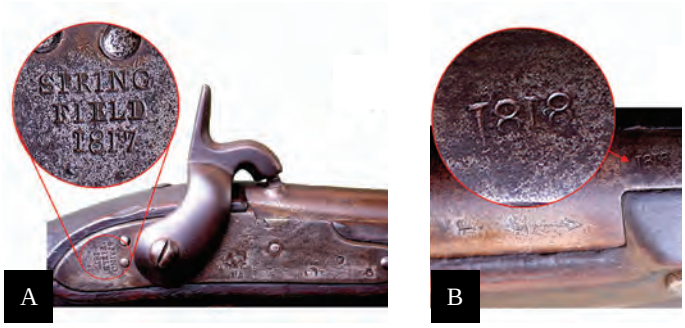

Figure 9. Details of the 2-band Springfield Armory "Short Musket" shown in Figure 8 showing stamping at the rear of the lock plate (A) and date on the breech plug tang (B).

Manufactory: .....Springfield Armory

Ignition system: .....Flintlock, muzzleloader

Caliber, bore: .....0.69, smoothbore

Barrel Length: .....36.00 inches

Overall Length: .....51.63 inches

Standard Issue Infantry
Firearm (length):.....pre-1816 Standard Musket; (59.50 inches)

Quantity Produced (years produced): 200 (1817-1818 only)

Variations: .....None

Identifying features of author's firearm example:
Two barrel bands, upper sling swivel attached English-style, lockplate dated 1817, barrel tang dated 1818, cone-in-barrel Springfield Armory alteration to percussion (Figure 9). The left barrel breech is stamped with a "P" / eagle head / "V".

Obtainability: .....Extremely rare

It is a curiosity of American firearms history that all three of the above models - the only identified antecedents of the true cadet guns - are also the only arsenal-made U.S. martial long arms to have ever had their upper sling swivels attached utilizing the English "Brown Bess" method (Figure 5).

Attempts to outfit cadets with reduced-size muskets met with varying degrees of success, but in general, they were not well received. Adaptations of full-sized infantry muskets for cadet use had significant shortcomings. Two main reasons for the cadets' aversion to these firearms were: 1) decreasing the barrel length did little to reduce weight and nothing to improve stock fit, both major factors for these diminutive cadets, and 2) by 1830, all three firearms discussed above were timeworn; indeed, the Charleville Pattern musket and the Indian Carbine were in their third decade of

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use, and even the Short Musket, issued new in 1818, was growing long in the tooth.

Finally, a Solution

To address the issues of these less-than-desirable cadet muskets at West Point, in early 1830 Brevet Colonel George Bomford, then acting, and later Chief of the Ordnance Corps (1832-1848) wrote similar letters to both Springfield's Roswell Lee and Secretary of War John H. Eaton (1829-1831) addressing USMA Superintendent Sylvanus Thayer's (1817-1833) concerns. This letter is significant for several reasons. First, it establishes that merely lopping several inches off the barrel contributes little to weight reduction. Second, it acknowledges that caliber reduction with its attendant component size reductions would be the correct course to follow. Third, in the Indian Carbine they realized they may have inadvertently come close to achieving their design goal.[18.]

Ordnance Office, War Department

Washington, January 24, 1830

Sir:

The Superintendent of the Military Academy is desirous of obtaining arms of a lighter model for the use of the cadets of the institution than those heretofore furnished.

The Department wishes to furnish such as are suitable for the purpose and as will be satisfactory to the officers.

I perceive by the armory returns that you have on hand a considerable number of 36-inch barrel muskets and a few of a 33-inch. As these muskets are the same as the established pattern in all respects except as to length, it is presumed they are not materially reduced in weight by not having been shortened. It is supposed, therefore, that an alteration consisting merely in a diminished length of barrel would not answer the purpose desired. Would these 36-inch or 33-inch barrels safely bear a reduction in weight by diminishing their diameters? If they would, lighter arms might thus be made without much inconvenience or extra cost.

It is supposed, however, that, in order fully to accomplish the purpose desired, the caliber of the arm should be reduced and a smaller lock be used, and this would be, in effect, the construction of an entirely new model. I am apprehensive that this course would involve the necessity of incurring very considerable expenses in constructing new tools and machinery, and am, therefore, desirous that some other means should be devised for furnishing the arms desired.

I perceive by the returns that you have still on hand 950 of the carbines made twenty years ago. These, if I do not mistake the arms, were light, neat, and well made pieces, but without bayonets; and, if so, would they not answer the end desired?

You will please consider the matters here suggested, and favor me with your opinions on them. I wish to know the weight of the several types of arms mentioned; and of the carbines, the caliber, weight, and length of barrel.

You will also consult Colonel Thayer in order to ascertain more particularly the description of arms, required, and especially the caliber and length of barrel and weight of the piece.

You will please also to state the probable cost of constructing the new tools, patterns, and machinery necessary in the event of making the arms desired on a new or different model.

The Department is very desirous of providing such arms as will meet the views of the officers of the Military Academy, and without incurring heavy extra expenses in making new tools or occasioning losses by deranging the regular operation of the armory. In the event of making use of the carbines, new tools would be required for the bayonets only, and these would not cost any considerable sum.

Colonel R. LEE,Springfield.

Respectfully,

GEO. BOMFORD,

Brevet Colonel, on Ordnance Service.

An attempt was made to salvage the carbines in storage by fitting them with bayonets per Bomford's suggestion (q.v.), but eventually Secretary of War Eaton approved the new manufacture of scaled-down muskets at Springfield Armory. Thus would begin the practice of producing firearms that resembled, though smaller in size, the standard infantry arm of the day - a practice that would continue until the introduction of smokeless powder several decades later.

Nine discrete reduced-size cadet models were made between 1830 and 1893, ending with the introduction of the full-sized cadet version of the U.S. Magazine Rifle, Model 1896. One adopted model also appeared in this 63-year period, the U.S. Musketoon, Model 1847, and is discussed herein. Of these ten models, five are muzzleloaders and were produced in the antebellum period and five were breechloaders and produced after the Civil War. A description of each model and their model variations follow. A summary of the characteristics of each long arm issued to cadets can be found in Appendix 1 while comparisons with the standard issue infantry firearm is presented in Appendix 2.

Accompanying these cadet model firearms are scaled-down socket bayonets, also made at Springfield Armory and in similar quantities as their mating firearm.

The Cadet Models in the Antebellum Period: The Muzzleloaders

The four distinct cadet models, and one adopted model, were produced before the Civil War by the Springfield Armory and all were muzzleloaders; one was ignited by flintlock and the other four were percussion-fired. They are as follows:

Figure 10. The Model 1830 Cadet Musket, 36-inch barrel version.

U.S. Cadet Musket, Model 1830

The first of the official cadet firearms made by Springfield Armory, the Model 1830 Cadet Musket (Figure 10, 11) was created during the long reign of the standard infantry arm, the Model 1816 Musket. The only cadet gun made with flintlock ignition, the sleek Model 1830 is a thoroughbred with respect to other contemporary Springfield Armory firearms. Many of the parts for this model

were subcontracted to Robert Johnson of Middletown, Connecticut and are the same as his Model 1817 U.S. contract rifle. Johnson had recently completed his government rifle contract, so he was already tooled-up for this effort, easing concerns for start-up costs and production interruption at Springfield. These parts include the lock, trigger, breech plug, side plate, tang and attendant screws.[19.]

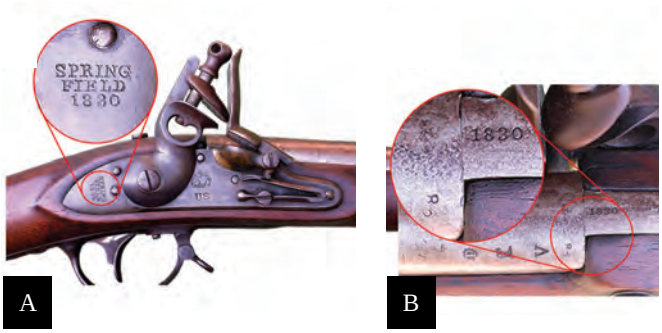


Figure 11. Detail of the 1830 Cadet lock (A) and rear barrel markings, including the date and serial number "98" (B).

The Model 1830 Cadet Rifle established two iconic features found on all cadet models until the full-sized Model 1896 Cadet Rifle appeared: a scaled-down stock with shortened barrel. One exception, the Model 1858 Cadet, does not feature a smaller stock (q.v.). The Model 1830 would also have a smaller caliber than its parent, a practice that would continue until the Model 1858 Cadet was introduced.

It is unclear why two barrel and two bayonet lengths were produced for the Model 1830, but the officers at the Academy were aware of the physical size limitations and perhaps experimented with issuing the shorter-barreled versions to the younger or smaller cadets. Providing barrel length options, however, was unique to this model and did not carry over into the next. The Model 1830 Cadet Musket and bayonet are both considered among the rarest of cadet arms.

Manufactory: .....Springfield Armory

Ignition system: .....Flintlock, muzzleloader

Caliber, bore: .....0.57, smoothbore

Barrel Length: .....36.00 and 40.25 inches

Overall Length: .....51.50 and 55.25 inches

Standard Issue Infantry Firearm (length):.....Model 1816 Musket; (57.50 inches)

Quantity Produced (years produced): 307 (1830-1831 only)

Variations: .....Two barrel lengths (quantity), 36.00 inch (154) and 40.25 inch (153).

Bayonet: Two blade lengths (quantity), 14.19 (154) and 15.94 (153) inches; 307 total produced at Springfield Armory, sized for both barrel lengths. Top mounting lug. "US" over "EB" (inspector Elizur Bates) stamped on the blade face (Figure 12).

Identifying features of author's firearm example: The lock plate and barrel tang are both dated "1830" (Figure 10, 11). A "US" stamping appears on the butt plate tang. There is an indistinguishable cartouche inside an oval on the left stock flat, and a deeply struck but unknown marking in the stock just behind the trigger guard. The left barrel breech is stamped with a scalloped oval surrounding a "P"/ eagle head / "V" / "98" (serial number).

Obtainability: .....Musket and bayonet are both very rare

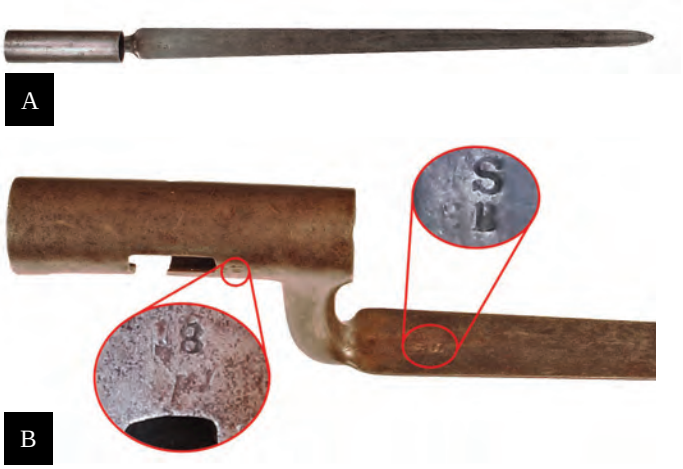


Figure 12. The Model 1830 Cadet bayonet (A). The bayonet blade face is marked "US" over "EB" while the "18" stamped above the socket mortise is likely a matchmark identifiable to the serial number of the gun to which it was originally paired (B).

U.S. Cadet Musket, Model 1841

Figure 13. The Model 1841 Cadet Musket.

The Model 1841 Cadet Musket was the first of the cadet firearms to utilize the percussion ignition system (Figure 13, 14). It was introduced concurrently in 1844 with the new percussion infantry arm, the Model 1842 Musket, but the cadet model was authorized first so its date nomenclature precedes that of its parent model. The lock was to be the same as the Model 1841 Rifle, first developed at Harpers Ferry Armory. The lock design was then passed to Springfield Armory for production in the cadet musket.[20.]

Figure 14. The lock design for the 1841 Cadet was borrowed from the Harpers Ferry Model 1841 Rifle.

Manufactory: ..... *Springfield Armory*

Ignition system: ..... *Percussion, muzzleloader*

Caliber, bore: ..... *0.57, smoothbore*

Barrel Length: ..... *40.00 inches*

Overall Length: ..... *55.25 inches*

Standard Issue Infantry Firearm (length): ..... *Model 1842 Musket; (57.75 inches)*

Quantity Produced (year): ..... *504 total; 250 (1844), 250 (1845), 4 (1846)*

Variations: ..... *The so-called "Engineer's Cadet Musket." In 1849 Watervliet Arsenal altered 20 standard 1841 cadets; the alteration involved restocking and barrel length changes to 31 inches (8 muskets) and 34 inches (12 muskets).*[21.]

Bayonet: The 1841 cadet bayonet was the first cadet bayonet with a locking ring (Figure 15). Springfield Armory produced 450 bayonets. They are stamped "US" on the blade face; 14.50-inch blade; bottom mounting lug.

Figure 15. The Model 1841 Cadet bayonet. Note "US" stamped on the blade face.

Identifying features of author's firearm example:
The lock plate and barrel tang are both dated "1844". The butt plate tang bears a "US" stamp. The left barrel breech is stamped with a "V" / "P"/ eagle head.

Obtainability: ..... *Musket is rare; bayonet is extremely rare.*

Figure 16. The Model 1847 Musketoon, Cavalry Model as modified for cadet and artillery use.

U.S. Musketoon, Model 1847: Cadet Variations

The Model 1847 was made in three basic versions at Springfield Armory: Artillery, Cavalry (Figure 16), and Sappers. No specific Model 1847 Cadet muskets were made in name, but all three of the above versions were used by cadets, either the Artillery without modification or alteration, or the Cavalry and Sappers, both of which underwent alteration by Springfield Armory to "Artillery" configuration for cadet use.

Manufactory: ..... *Springfield Armory*

Ignition system: ..... *Percussion, muzzleloader*

Caliber, bore: ..... *0.69, smoothbore*

Barrel Length: ..... *26.00 inches*

Overall Length: ..... *41.06 inches*

Standard Issue Infantry Firearm (length): ..... *Model 1842 Musket; (57.75 inches)*

Type:	*Quantity Produced:*	*Years Produced:*
Artillery:	*3,201 total*	*(1848-1850; 1852-1855)*
Sappers:	*1,030 total*	*(1847-1848; 1855-1856; 1856-1857)*
	228 altered to artillery/cadet configuration	
Cavalry:	*5,802 total*	*(1847-48; 1850-1851; 1853-1854; 1858-1859)*
	630 altered to artillery/cadet configuration	

Variations:

Artillery model: The Artillery model was originally made with sling swivels and bayonet lug, so it could readily be adapted for cadet use without changes. No modifications or alterations were made to this model and were issued directly to state military academies.

Sappers model as altered for artillery or cadet use: The Sappers model was equipped with sling swivels and saber bayonet lugs. To convert to Artillery/ Cadet configuration, the saber bayonet lugs were removed and a lug for the angular socket bayonet was added under the barrel. Other changes included: replacing the upper barrel band with the artillery style, replacing the button-head ramrod with the trumpet-style, and removing the sling swivels.

Cavalry model as altered for artillery or cadet use: Two basic alterations were considered: 1) Braze a bayonet lug on the existing barrel and replace the stock and all cavalry-specific parts with original artillery parts. Only the barrel and lock were salvaged with this alteration; 2) Braze a bayonet lug on the existing barrel (leading to the replacement of the swivel ramrod with a trumpet ramrod) and retain the stock and all of the brass cavalry components (Figure 17). Remove the side bar and attachment points and add upper and lower sling swivel lugs (Figure 18).[22.]

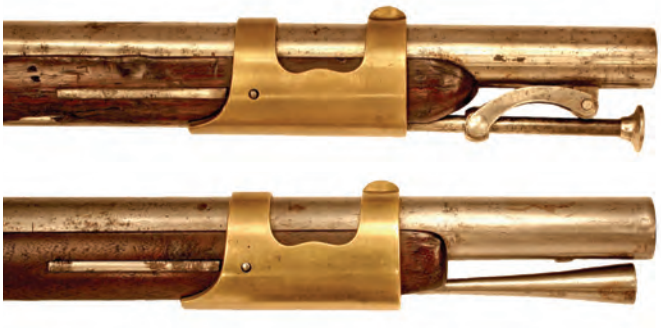


Figure 17. Muzzle-end comparison of original Cavalry Model (top) and Cavalry Model with Artillery/ Cadet alteration (bottom). In this alteration the brass furniture was retained throughout. Note the addition of a bayonet lug in the bottom photo.

Figure 18. Comparison between the original Cavalry Model (bottom) and Cavalry Model with Artillery/ Cadet alteration (top). In the top photo, note how the barrel band was salvaged by removing the sling bar lug and adding the sling swivel lug.

Bayonet: The Model 1835 Musket bayonet with the standard 18.88-inch blade will fit the 1847 Artillery (and altered Cavalry and Sappers models), but other shorter versions were made, including a 14.88-inch blade variation (Figure 19). They have a "US" stamp on the blade face.

Figure 19. The Model 1847 Musketoon bayonet with a 14.88-inch blade.

Identifying features of author's firearm example:
Model 1847 Musketoon, Cavalry, altered to Artillery/Cadet using the second cavalry method described above (C.2). The lock plate is dated "1851" and the inspector's initials "JS" (James Stillman) appear in an oval cartouche on the left stock flat. The barrel has the "V"/ "P"/eagle head series of vertical stamps. The butt plate bears a "US" stamping.

Obtainability: .....Musket in this configuration and bayonet are both scarce.

U.S. Cadet Musket, Model 1851

Figure 20. The Model 1851 Cadet Musket, rifled and sighted version.

The Model 1851 Cadet Musket (Figure 20) is similar to the Model 1841 but utilizes the thinner 1847 Musketoon lock (Figure 21) and subsequently a slightly larger diameter barrel to attain the proper lock-to-nipple alignment. The 1851 Cadet also utilizes some mounting hardware borrowed from the 1847 Musketoon. The Model 1851 was originally not intended for West Point use; instead, most were sent to state military academies.[23.]

Manufactory: .....Springfield Armory

Ignition system: .....Percussion, muzzleloader

Caliber, bore: .....0.57, smoothbore (323 rifled in 1856-1857)

Barrel Length: .....40.00 inches

Overall Length: .....55.13 inches

Standard Issue Infantry Firearm (length):.....Model 1842 Musket; (57.75 inches)

Quantity Produced (year): .....4,000 total; 2,840 (1852), 1,160 (1853)

Variations: Rifled and sighted version. Following the practice of rifling the standard shoulder arms, in 1857, 323 unissued Model 1851 Cadet Muskets were altered by adding rifling and the 1855-style long-range rear- and blade front sights (Figure 21). It is reported that 300 of these were sent to West Point.

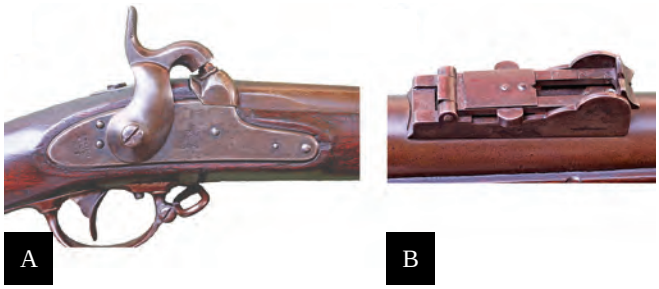


Figure 21. The Model 1851 Cadet lock is the same as what was used in the 1847 Musketoon (A). A Model 1855 rear sight was added in 1857, along with rifling, to some 323 Model 1851 Cadet Muskets held in storage (B).

Bayonet: Springfield Armory produced 4,700 total bayonets in 1852 and 1853. This is the only American bayonet to have two shoulders on the socket, one on either side of the locking ring (Figure 22). The locking ring is also unique in that the stop pin rides in a center groove milled in the ring. They are stamped "US" on the blade face; 14.50 inch blade; bottom mount.

Identifying features of author's firearm example:
Rifled and sighted alteration that went to West Point. The lock plate and barrel tang are both dated "1853." The barrel is marked "V"/ "P" / eagle head.

Obtainability: .....Rifled and sighted musket version is very scarce; bayonet is rare.

Figure 22. The Model 1851 Cadet bayonet (A). Note the unique lockup arrangement, with two shoulders and a slotted locking ring (B, C). The standard "US" marking is found on the blade face. The number "49" appearing on both the locking ring and the socket are thought to be of Virginia Military Institute provenance (A and C). A number stamped at the base of the socket, "224" in this example, is consistent with other bayonets of this type, although of unknown origin (B).

U.S. Cadet Musket, Model 1858

Figure 23. The Model 1858 Cadet Musket.

Previous cadet model firearms were scaled down throughout, so the locks used were smaller than their parent models. With one exception, the 1858 Cadet Musket (Figure 23) would usher in the concept of using the same lock as the standard issue long arm, and beginning with this model, all cadet guns would match the caliber of their parent arm. A shorter, 38 inch barrel and standard stock with shortened fore end would be fitted on the 1858 Cadet, and the appearance was that of its parent given this directive: "… make the parts correspond as near as possible with those of the rifle-musket…."[24] This configuration, therefore, is a reversion to the 1817 "Short Musket" mode: essentially a standard 1855 rifle with a shorter barrel, and as such resurrecting the same stock fit-up problems with smaller cadets that had been solved with the three previous cadet models. This approach was short-lived, however, as all future cadet models would revert to the trimmer stock concept. The Model 1858 Cadet Musket, like the Model 1855 Rifle-Musket, utilizes the Maynard tape primer system (Figure 24). This cadet model was not intended to go to West Point.

Figure 24. The Model 1858 Cadet Musket retains most of the components of its parent Model 1855, including the lock system with the innovative Maynard tape priming feature.

Manufactory: .....Springfield Armory

Ignition system: .....Percussion, muzzleloader

Caliber, bore: .....0.58, rifled musket

Barrel Length: .....38.00 inches

Overall Length: .....53.13 inches

Standard Issue Infantry Firearm (length):.....Model 1855 Rifle-musket; (55.94 inches)

Quantity Produced (year): .....2,501 total; 1,501 Type I (1858), 1,000 Type II (1859-1860)

Variations: Type I: 1858 date on lockplate and top barrel flat; brass fore end cap; patchbox on right of stock.
Type II: 1859 or 1860 date on lockplate and top barrel flat; iron fore-end cap; no patchbox.
Bayonet: Approximately 3,500 scaled down Model 1855 bayonets were made at Springfield Armory (Figure 25). They are stamped "US" on the blade face; 16.0-inch blade.
Identifying features of author's firearm example:
The lockplate is dated "1859." The barrel is marked "1859" with "V"/ "P" / eagle head view and proofmarks. There is a faint "JS" (James Stillman) cartouche on the left stock flat; no patchbox. A "US" stamping appears on the butt plate tang.

Obtainability: .....Musket is scarce; bayonet is rare.

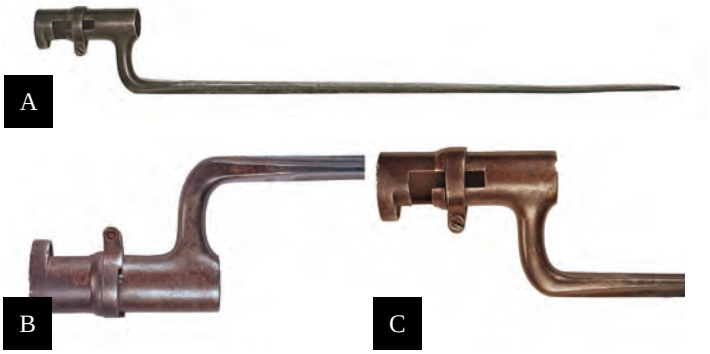


Figure 25. The Model 1858 Cadet bayonet (A) with configuration of the socket mortise (B, C). The blade face is stamped with "US".

The Cadet Models in the Postbellum Period: The Cartridge Breechloaders

Wartime has often driven military planners to volte-face deviations, which in turn offer fertile ground for paradigm shifts in technology development. For the gun industry, the American Civil War supplied very rich bottomland. The Civil War provided the catalytic thrust, born of urgency and nurtured by funding, that enabled epic advancements in armament technology. Inventions related to firearms that had already been on the drawing board or in limited use, but lacked major sponsorship, were now exposed to the rigors of battle, weather, and tactical utility. Through it all, two embryonic and symbiotic technologies would successfully emerge, thus beginning the standard in use to this day: the breechloader and the metallic cartridge.

The notion to limit cadet gun uniqueness to simply a shorter barrel would begin and end with the Model 1858 Cadet Musket-Rifle. The lesson relearned, all subsequent cadet rifles would have scaled-

down stocks easily distinguished from their parent, along with shorter barrels. Otherwise, with the exception of the Model 1866 Cadet, parts in future cadet guns (excluding buttplate and ramrod, of course) would be interchangeable with their parent gun.

While many ingenious breechloading systems were tested under fire during the Civil War, relatively few would survive as viable firearms in the postbellum market. The Remington "rolling block" was a latecomer that became popular after the war, but most other designs would yield to post-war plans to alter existing Model 1861/1863 muzzleloaders to the so-called Allin breechloading system. Developed at Springfield Armory under the supervision of Master Armorer Erskin S. Allin, the design that bore his name was chosen over several worthy competitors. In modern times this firearm action would become known as the "trapdoor" because of the hinged breechblock appearance and operation. From 1867 to 1893 five distinct, reduced-size cadet models were produced by Springfield Armory, and all were breechloading cartridge guns utilizing the trapdoor action, with the exception of one utilizing the rolling block action. They are as follows:

U.S. Cadet Rifle, Model 1866[25.]

As mentioned in the previous section, the concept of using the same firing mechanism and as many parts as practicable in cadet guns as are used in the standard issue long arm had one exception: the Model 1866 Cadet Rifle (Figure 26). Its lockplate, hammer, and breechblock are unlike any other (Figure 27). Outside appearance notwithstanding, the unique-to-this-model 1867-dated lockplate (the only Springfield Armory lockplate of any type bearing this date) is thinner (0.190") than the standard (0.300"). To accommodate the thinner lockplate, the hammer has less of an offset. The 1866-dated breechblock has two radiused lightening cuts, leaving a distinctive center rib on the underside of the breechblock. This model was made new and is not a conversion from surplus longarms in inventory as was its parent model. Most of the other parts are not interchangeable with the Model 1866 Rifle, but it does use the same rear sight.

Figure 26. The Model 1866 Cadet Rifle.

Figure 27. The 1866 Cadet has a unique, thinner lockplate dated 1867 (A). This is the only model where Springfield Armory used this date on a lockplate. The breech block is dated 1866 (B).

Manufactory: ..... *Springfield Armory*

Ignition system: ..... *Centerfire cartridge, breechloader*

Caliber, bore: ..... *0.50-55, rifled*

Barrel Length: ..... *33.00 inches*

Overall Length: ..... *48.00 inches*

Standard Issue Infantry Firearm (length): ..... *Model 1866 Rifle (2nd Allin); (55.88 inches)*

Quantity Produced (year): ..... *424 total; 320 (1867), 104 (1868)*

Variations: ..... *none*

Bayonet: The .50 caliber cadet bayonets are interchangeable with all three Springfield Armory .50 caliber cadet models: the Models 1866, 1867 Navy, and 1869 Cadet Rifles. Springfield Armory produced enough bayonets to cover all rifle production, 4,344, plus an unknown number of replacements in the ensuing years. Stamped "US" on the blade face, with 16.25 inch blade (Figure 28).

Figure 28. The 1855-style Cadet bayonet is interchangeable among all three models of .50-caliber Cadet rifles. Note "US" stamped on the blade face.

*Identifying features of author's firearm example: The lockplate is dated "1867" and the breechblock "1866" / eagle head (Figure 27). There is an "ESA" (Erskine S. Allin) cartouche inside an oval on the left stock flat. The butt plate tang has a "U*S" stamping.*

Obtainability: ..... *Rifle is rare; bayonet is scarce.*

U.S. Cadet Rifle, Model 1867 Navy

Figure 29. The Model 1867 Cadet Navy Rifle.

The Model 1867 Navy Cadet Rifle (Figure 29), *"...was the only rifle ever designed specifically for the midshipmen at the U.S. Naval Academy... and enjoyed the longest tenure (some 22 years), in unaltered form, of any Springfield-produced arm of the period."*[26.] This arm was made at Springfield Armory utilizing the Remington No. 1 rolling block action, but the "Springfield Armory" maker's mark does not appear anywhere on the firearm.

Manufactory: ..... *Springfield Armory*

Ignition system: ..... *Centerfire cartridge, breechloader*

Caliber, bore: ..... *0.50-45, rifled*

Barrel Length: ..... *32.56 inches*

Overall Length: ..... *47.38 inches*

Standard Issue Infantry Firearm (length): ..... *Model 1866 Rifle; (55.88 inches)*

Quantity Produced (year): ..... *498 (1868)*

Variations: ..... *none*

Bayonet: ..... *Same as 1866 and 1869 Cadet Rifles (Figure 28).*

A B

Figure 30. The 1867 Cadet Navy rolling block receiver markings include (A) "P" over "F.C.W." (Inspector Franklin C. Warner) and (B) an anchor symbol indicating U.S. Navy procurement.

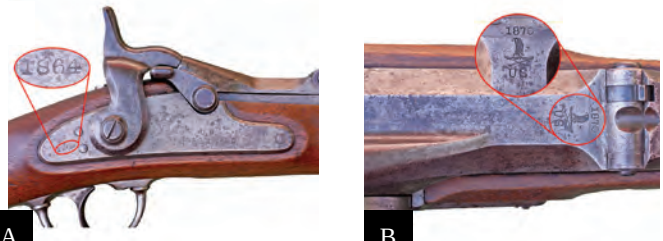
Identifying features of author's firearm example:
The receiver is stamped on the right side, center, bottom: "P/F.C.W." (Franklin C. Warner) and on the left side, center, bottom: Anchor symbol (Figure 30). The receiver tang bears the standard "REMINGTONS ILION N.Y. U.S.A." / patent date information found on rolling block actions. A "US" stamping appears on the butt plate tang.

Obtainability: .....Rifle is rare; bayonet is scarce.

U.S. Cadet Rifle, Model 1869

Figure 31. The Model 1869 Cadet Rifle

In an attempt once again to standardize, the Model 1869 Cadet Rifle is similar to the Model 1866 Cadet Rifle except it utilizes the full-size 1863 and 1864 dated locks and the breechblock is the same as the Model 1868 Rifle (Figure 31, 32). Serialization also begins with this model; barrel and receiver are both stamped on the left side where the two are joined. This cadet model has its own serial number range, beginning with "1" through "3422."



A B

Figure 32. The 1869 Cadet Rifle utilizes surplus lockplates dated 1864 (A), while the breech block is dated 1870 (B).

Manufactory: .....Springfield Armory

Ignition system: .....Centerfire cartridge, breech-loader

Caliber, bore: .....0.50-55 (.50-70 chambering), rifled

Barrel Length: .....29.60 inches

Overall Length: .....49.00 inches

Standard Issue Infantry

Firearm (length):.....Model 1868 Rifle; (52.00 inches)

Quantity Produced (year): 3.....,422 (1871-1872)

Variations: .....none

Bayonet: .....Same as the 1866 Cadet and the 1867 Navy Cadet (Figure 28).

Identifying features of author's firearm example:
The lockplate is dated "1864" and the breechblock "1870" / eagle head / crossed arrows / "U.S." (Figure 32). There is an "ESA" (Erskine S. Allin) cartouche inside an oval on the left stock flat. The serial number is stamped "2260" in the two areas indicated above. The butt plate tang bears a "US" stamping.

Obtainability: .....Rifle is somewhat scarce; bayonet is scarce.

U.S. Cadet Rifle, Model 1873 and Model 1884

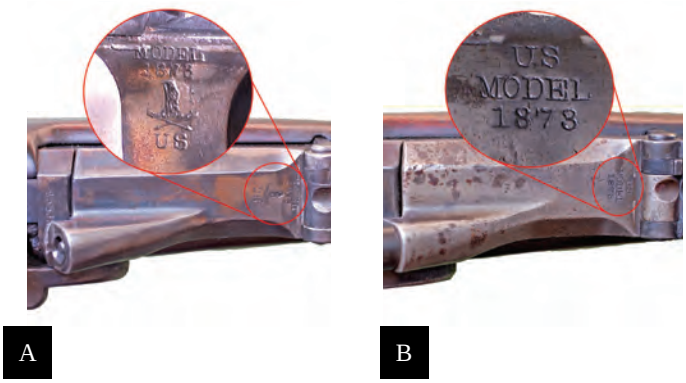
Authorized by Act of Congress, in 1872 the since-named "Terry Board" convened for the purpose of determining what breech-loading system should be adopted to replace the .50 caliber Allin system. Over 100 breech-loading rifles were submitted, but the tests were primarily focused on cartridge performance rather than weapons function. Accuracy, not rapidity of fire, was given sway, so the variables of caliber, powder load, bullet weight, and rifle twist dominated over magazine capacity or how well or how quickly the cartridge was fed into battery. When the smoke cleared, what resulted was the adoption of a .45 caliber version of the Allin system! The die was cast, and for the next twenty years the standard infantry arm would be a .45 caliber, single-shot, top-loading, hinged-breech rifle.[27.]

It is difficult to discuss the cadet rifle alone without including the standard issue rifle and carbine, as they all share the same continuous serial numbering and component upgrades. Serial numbers start with "1" in 1873 and end at about "567834" in 1893. Trapdoor serial numbers are dependent only upon their order in the manufacturing sequence and not tied to any model number or type. Production of the Model 1873 Cadet Rifle does not begin in earnest until about serial number 35224 (1875) with only a few made earlier.

Figure 33. The Model 1873 Cadet Rifle.

Figure 34. The Model 1884 Cadet Rifle.

There are only two official models of Cadet Rifle (and Rifle) trapdoors (Figures 33 and 34), the Model 1873 and the Model 1884 as delineated on their breechblocks (Figures 35 and 36), but they are essentially the same gun. The lockplate "1873" dating was removed well before the Model 1884 was introduced, so the



A B

Figure 35. Breechblock model markings changed in the Model 1873 (c.1876) when the eagle/arrow motif was removed, and the "US" relocated. Breechblock for the Model 1873 Cadet Rifle, serial number 25535[28.] (A) and 98160 (B).

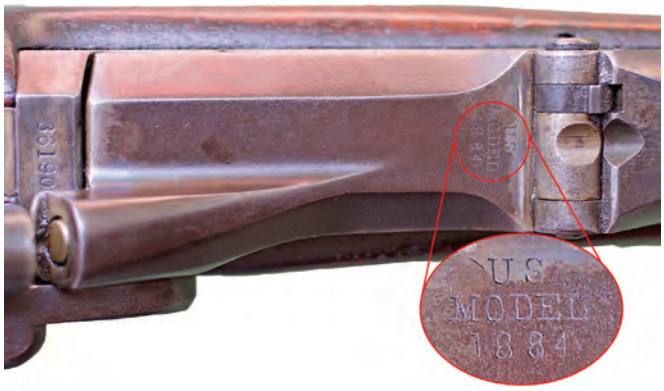
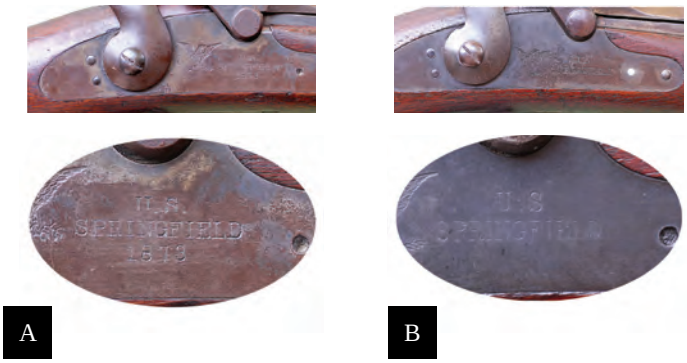


Figure 36. The Model 1884 designator first appeared on the breechblock in 1886 when the Model 1884 was introduced.

absence of this marking is not necessarily an indicator of model (Figure 37). For some reason the Model 1873 firearm was officially changed to the Model 1884 with the introduction of the Model 1884 (Buffington) rear sight. This is especially curious because the introduction of the two previous sight models, Models 1877 and 1879, did not induce a model name change to the firearm itself. Also, there is some misunderstanding that a Model 1878 Cadet Rifle and Rifle exists, but as Figure 38 depicts, it is simply a deeply-struck "3" that appears as an "8".



A B

Figure 37. The lockplates of all .45-caliber "Trapdoors" are of the two varieties shown. The "1873" date (A) was removed c.1877 (B).

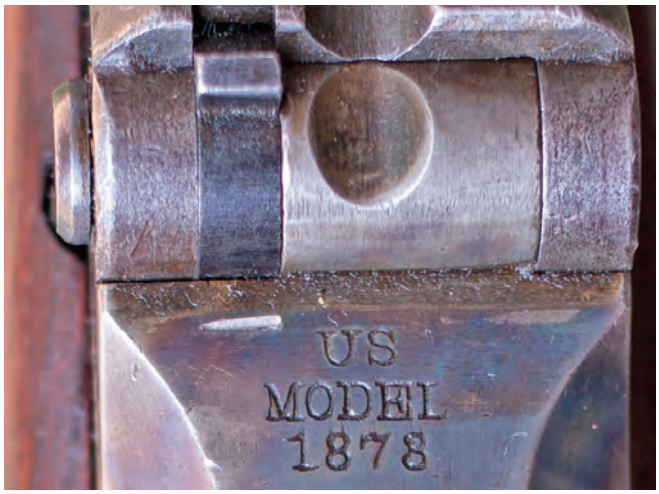


Figure 38. The enigmatic "Model 1878" is nothing more than a deeply-struck "3" giving the impression (literally) that it is an "8." There never was a Model 1878 "trapdoor."

Features that would remain unchanged in the 1873 and 1884 Cadet Rifles throughout their long production life are the 29.60-inch barrel and the slimmer stock profile, with its nine-inch comb and long wrist, despite the change to a longer comb in the rifle stock.[29.] Most parts in the cadet gun are the same as the parent rifle and realized the same changes and improvements, except the barrel with its shorter ramrod and the stock with its narrower buttplate. Component changes were cut into production and field repairs and arsenal upgrades conducted independent of each other and without respect to any model type or serial number range. When the Rifle received a rod bayonet late in production the Cadet Rifle retained its standard ramrod. The Cadet Rifles did not have sling swivels until the last three years of production, as only stacking swivels were used previously.[30.]

As with most other components, the Cadet Rifle and the Rifle share the same rear sight. The 1898 manual, Description and Rules for the Management of the Springfield Rifle, Carbine, and Army Revolvers Calibre .45[31.] lists three models of rear sight and their variations: Model 1877, Model 1879, and Model 1884. It is perhaps from this document that modern collectors assign the same sight model numbers to the firearms themselves (hence four models when one includes the Model 1873), as the rear sight projects the most recognizable difference in appearance. These four sight models will be detailed below as Cadet Rifle model variations.

Manufactory: ..... *Springfield Armory*

Ignition system: ..... *Centerfire cartridge, breech-loader*

Caliber, bore: ..... *0.45-55 (.45-70 chambering), rifled*

Barrel Length: ..... *29.50 inches*

Overall Length: ..... *48.9 inches*

Standard Issue Infantry Firearm (length): ..... *Model 1873/ 1884; (51.9 inches)*

Quantity Produced (year): ..... *Total 22,094 (1874-1893)*

Model 1873 ..... *9,594 (1874-1885)*
Serial no. range: 35000 to 387000

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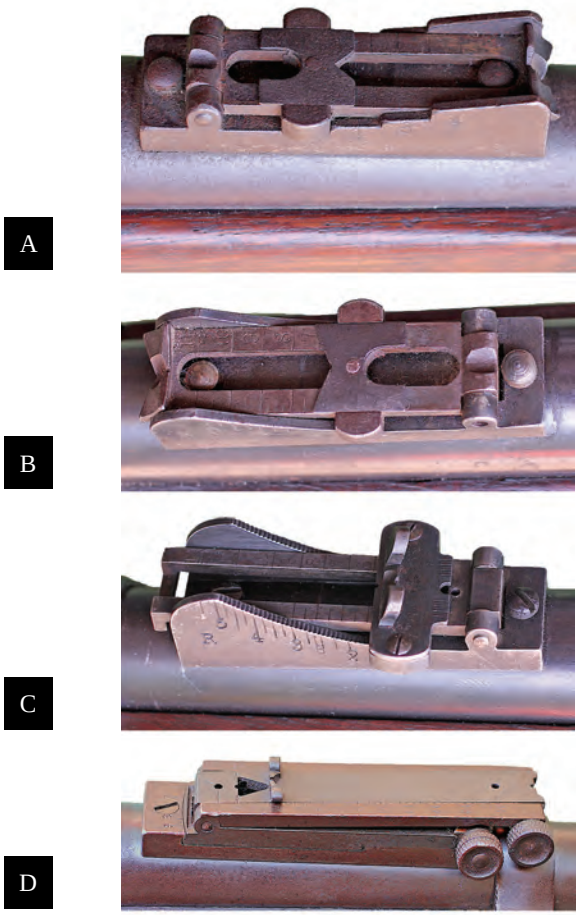

Figure 39. The two official Cadet (and Rifle) models (1873 and 1884) are sometimes delineated into four distinct models by virtue of the four models of rear sights used. The sight models and their approximate serial number (SN) and date ranges are as follows: (A) Model 1873 "stepped" from SN 0 until SN 80000 (1873-1877); (B) Model 1877 "continuous ramp" from SN 75000 thru SN 115000 (1877-1879); (C) Model 1879 "buckhorn" from SN100000 thru SN 300000 (1879-1884); (D) Model 1884 "Buffington" from SN 280000 thru SN 568000 (1884-1893). Note there are significant overlaps in serial number ranges between sight types.

Model 1884.....12,500 (1888-1893) Serial no. range: 387000 to 567834

Sight Model Variations. Cadet Rifle rear sights are the same as the Rifle; front sights are slightly lower to compensate for the reduced-load of the .45-55 cartridge:

Model 1873 (Figure 39A) Stepped with 400-yard base and 1,100-yard leaf; 'R' marked right side. Approximate Cadet Rifle quantity produced (approximate serial number range): 3,000 (35000 to 78000)

Model 1877 (Figure 39B) Continuous curved with 500-yard base and 1,100-yard leaf; 'R' marked left side. Approximate Cadet Rifle quantity produced (approximate serial number range): 1,050 (75000 to 115000)

Model 1879 (Figure 39C) Continuous curved "buckhorn" rear sight with 500-yard base and 1,200-yard leaf; 'R' marked left side, (5 different versions). Approximate Cadet Rifle quantity produced (approximate serial number range):4,500 (100000 to 300000)

Model 1884 (Figure 39D) Buffington with 500-yard base and 1,200-yard leaf; 'R' marked upper right of leaf. Approximate Cadet Rifle quantity produced (approximate serial number range): 13,500 (280000 to 567834)

A few other characteristic features of the Cadet Rifle (similar to Carbine and Rifle):

Inspector stamp (on left stock flat)....approx. date ..... serial number range:

ESA in oval:.....1874-1877..... 35000-74000

ESA/year in oval:.....1877-early 1879 74000-114000

SWP/year in rectangle: .....early 1879-1893 114000-567834

Lockplate Inscription.....approx. date..... serial number range:

U.S./Springfield/1873 .....1873/1874-early 1877..... 35000-77000

U.S./Springfield.....late 1876-1893..... 73000-567834

Breechblock.....approx. date..... serial number range:

Model/1873/eagle/arrows/U.S.....1874-mid-1876 35000-70000

U.S./Model / 1873.....mid-1876-late 1886..... 70000-360000

U.S./Model / 1884.....late 1886-1893..... 370000-567834

Bayonet: .....The .45 caliber Cadet Rifle bayonet is either made new as a Model 1873, or a Model 1855 with a swaged or sleeved socket. Stamped "US" on the blade face with blade 16.25 inches long (Figure 40).

Figure 40. The .45 caliber "Trapdoor" Cadet bayonet. Note "US" stamped on the blade face.

Identifying features of author's Model 1873 Cadet with Model 1873 stepped rear sight, serial number 73427: 2-position tumbler, narrow receiver, high-arch breechblock, undated lockplate. Breechblock markings: U.S./MODEL/1873. Stock cartouche: "ESA" in oval (no date). Note: for all examples listed the butt plate tang bears a "US" stamping.

Identifying features of author's Model 1873 Cadet with Model 1877 continuous arch rear sight, serial number 98160: narrow receiver, low-arch breechblock, undated lockplate. Breechblock markings: U.S./MODEL/1873 (Figure 36B). Stock cartouche: none; replacement stock.

Identifying features of author's Model 1873 Cadet with Model 1879 buckhorn rear sight, serial number 150103: wide receiver, high-arch breechblock, undated lockplate. Breechblock markings: U.S./MODEL/1873. Stock cartouche: unreadable; possible replacement stock.

Identifying features of author's Model 1884 Cadet with Model 1884 Buffington rear sight, serial number 361909: wide receiver, low-arch breechblock, undated lockplate. Breechblock markings: U.S. / MODEL / 1884 (Figure 38). Stock cartouche: "SWP / 1886". Equipped with sling swivels.

Obtainability: Be wary of "all original" .45-70 "Trapdoor" models of any type. A genuine original would be quite uncommon given the number of field and arsenal upgrades that have occurred during their period of use, not to mention handling by surplus marketers, or by dealers and gun owners who may have attempted to restore factory originality to these popular guns over the years. The bayonet is not uncommon.

In addition, in 1895, 1,800 rifles, and again in 1891, 7,000 rifles, were converted and re-issued as Cadet Rifles. These should show signs of alterations, such as the inspector stamp: "J.S.A." / date (1895 or later), signs of rifle stock modifications, barrel proof scant or removed from polishing, and serial numbers not matching the stock dates.

Conclusion

Eight decades of modifying existing, or manufacturing new, smaller-sized cadet guns had now come to an end. When the bolt-action .30-40 Krag-Jorgensen was adopted to replace the venerable .45-70 "Trapdoor" Springfield as the standard U.S. infantry arm, a reduced-size cadet firearm was no longer necessary. [32.]

By the end of the nineteenth century the circumstances making reduced-size cadet guns essential in the first place were virtually nonexistent. Firearm technology changes after the American Civil War effected an increase in common component usage between the standard issue rifle and the cadet rifle. Ultimately, the introduction of smokeless powder quickly rendered infantry firearms, and consequently cadet firearms, down to a size standard that remains today. Also, cadet enrollment became restricted to males aged 17 years and older, so no longer were young boys permitted to enroll as cadets. Finally, American infrastructure and farming technologies increased protein consumption, prompting the growth and maturity of males to a level where cadets were both larger and closer to adult stature when they entered the service academies.

These factors clearly obviated the need for a reduced-size firearm. As cadets got bigger and guns got smaller an interesting turnabout occurred: In the two-hundred years since it was first determined that a gun smaller than standard-issue was needed to outfit cadets, a cadet now drills with a firearm that is larger than what he or she will carry into combat. Indeed, the current standard infantry firearm is the M16 Rifle and its derivative, the M4 Carbine, while the predominant drill rifles today are the M1903A3, M1, and M14 Rifles!

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Endnotes

1 Hereafter referred to as "USMA", "West Point", or "the Academy" when referring to the institution. When referring to the student body of West Point cadets, "the Corp of Cadets" or "the Corps" may be used, while the lowercase "cadet(s)" will be used both to denote attendees of service academies in general, and West Point in particular. For the sake of consistency, the author has chosen to capitalize "Cadet" when used in firearm and bayonet nomenclature, although original sources varied in the use of upper- and lower-case naming.

2 Hereafter referred to as "Springfield Armory," "Springfield," or simply "SA."

3 The modern term for this firearm is "Springfield Model 1795" but this nomenclature was never assigned or used in its period of use.

4 The American Antebellum Period for this discussion is inclusive of the time between the end of the War of 1812 (1815) and the beginning of the American Civil War (1861).

5 John Komlos, The Height and Weight of West Point Cadets: Dietary Change in Antebellum America. *The Journal of Economic History 47, no. 4* (1987): 897-927. Available online at: http://www.jstor.org/stable/2122037. This relevant study makes inferences on the nutritional deficiencies of American males during the antebellum period by using USMA data.

6 Col. Frederick P. Todd, *Cadet Gray* (New York: Sterling Publishing, 1955), 16-17, 21.

7 Springfield Armory National Historical Site, accessed August 2, 2018, https://www.nps.gov/spar/index.htm

8 National Archives and Records Administration Record Group (hereafter NARA RG) 156, Entry 21, Box 2 as cited in Schmidt, *U.S. Military Flintlock Muskets and Their Bayonets: The Early Years 1790-1815*, 398.

9 NARA RG Entry 1362 as cited in Schmidt, *U.S. Military Flintlock Muskets and Their Bayonets: The Early Years 1790-1815*, 398.

10 NARA RG Entry 156, Entry 21, Box 5 as cited in Schmidt, *U.S. Military Flintlock Muskets and Their Bayonets: The Early Years 1790-1815*, 399.

11 John Morton of West Point to Lee in a 15 January 1815 letter as cited in Moller, *American Military Shoulder Arms Vol. II*: From the 1790's to the End of the Flintlock Period, 60. A reasonable assumption is that Morton was referring to the altered Indian Carbine, which was issued about the same time. As we will see, the carbines were not well liked either.

12 The Standard Issue Infantry Firearm as used here is the firearm that a cadet might otherwise be carrying in the absence of a cadet-size gun, and not necessarily the firearm from which that particular cadet gun was modeled.

13 The modern term for this firearm is "*Model 1807 Indian Carbine*" but this nomenclature was never assigned or used in its period of use.

14 Letters from Dearborn to Prescott 3 March 1807, Prescott to Dearborn 13 March 1807, and Dearborn to Prescott 20 March 1807 as cited in Hicks, *U.S. Military Firearms 1776-1956*, 26.

15 Bomford to Lee in a letter dated 24 January 1830 as cited in Hicks, *U.S. Military Firearms 1776-1956*, 60.

16 The modern term for this firearm is "Model 1817 Artillery/ Cadet, Type 1" but this nomenclature was never assigned or used in its period of use.

17 Wadsworth to Lee letter 29 January 1817 as cited in Hicks, *U.S. Military Firearms 1776-1956*, 57-8.

18 Bomford to Lee in a letter dated 24 January 1830 as cited in Hicks, *U.S. Military Firearms 1776-1956*, 60.

19 In a letter from Springfield Armory Superintendent John Robb (1833-1841) to Captain Alfred Mordecai, the assistant to the Chief of Ordnance, dated 21 October 1839 as cited in Hicks, *U.S. Military Firearms 1776-1956*, 61.

20 Bomford to Robb in a letter dated 19 February 1841 as cited in Hicks, *U.S. Military Firearms 1776-1956*, 69.

21 Chief of Ordnance Colonel Talcott (1848-1851) to General Totten of West Point in a letter dated 1 November 1848 as cited in Moller, *American Military Shoulder Arms Vol. III: Flintlock Alterations and Muzzleloading Percussion Shoulder Arms*, 1840-1865, 185-86.

22 Moller, G. D. *American Military Shoulder Arms Vol. III*: *Flintlock Alterations and Muzzleloading Percussion Shoulder Arms, 1840-1865*, (University of New Mexico Press, Albuquerque, NM, 2011)228-29; 237-38.

23 Moller, G. D. 243-47.

24 Direction given by Chief of Ordnance Colonel H. K. Craig (1851-1861) to Springfield Armory Superintendent James Whitney (1854-1860) in a letter dated 23 March 1858, based on recommendations of Captain J. G. Benton to Colonel Craig (in a letter dated 10 January 1858) and approval of said recommendations by the Ordnance Board, as cited in Hicks, *U.S. Military Firearms 1776-1956*, 86. In these correspondence the term "Rifle-Musket" was used to describe the parent gun, the Model 1855, but not the Cadet, which retained the "Musket" nomenclature.

25 Also known as Model 1867 Cadet Rifle. To avoid confusion with the arcane and unofficial 1865 Cadet, the 1866 "short rifle," and aftermarket modified 1866 rifles, Hosmer (pages 20-21, 38, and 44), et al. prefered to refer to this arm as the "1867 Cadet Rifle."

26 Hosmer, R. A. *The .58- and .50-Caliber Rifles & Carbines of the Springfield Armory 1865-1872*, (North Cape Publications, Tustin, CA. 2006) 118.

27 Frasca, A and R. H. Hill, The *.45-70 Springfield*, (Frasca Publishing, Springfield, Ohio, 2000) 5-6.

28 This breechblock of serial number 25535 is representative of the early style of breechblock marking used in all trapdoor types up to approximately serial number 70000. This particular serial number precedes the first Cadet production guns by ten-thousand, of which only a few were made, so the authenticity of this firearm as an original Cadet has yet to be verified.

29 The stock receiver cutout was widened to accommodate a wider receiver c.1878 but did not alter its outward appearance.

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Endnotes (cont.)

30 For an excellent chart depicting the independent changes of each major component over time / serial number range see: Frasca and Hill, *The .45-70 Springfield*, 380-81.

31 1898 edition as reprinted in: Frasca and Hill, *The .45-70 Springfield*, 332.

32 A short-lived, full-sized Krag cadet version was made: the Model 1896 Cadet Rifle - differing from its parent rifle only slightly it that it retained the outmoded one-piece cleaning rod. The ramrod was subsequently removed when these cadet guns were arsenal-altered in 1898 to Model 1896 Rifle configuration, and from that point on, no further cadet-designated models were manufactured by Springfield Armory.

Appendix 1

A summary of thirteen Springfield Armory-produced types or models of reduced-size Cadet guns, including: three antecedents, nine official models, and one adopted model.

Charleville Pattern Musket with 33-inch barrel (Modern nomenclature: Model 1795 Musket) Smoothbore flintlock muzzleloader, 0.69 caliber, nominally 32.50- to 33.00-inch barrel. Of several thousand cut-down in 1813, approximately 300 of these were known to have been issued for service, and those were reportedly sent to West Point.

Carbine for Indians (Modern nomenclature: Model 1807 Indian Carbine). Smoothbore flintlock muzzleloader, 0.54 caliber, 33.75-inch barrel length. Approximately 1,201 were initially made between 1809-1810. An unknown quantity had sling swivels installed in 1814 and sent to West Point; approximately 321 were altered for bayonets in 1830-32.

Short musket for Artillery or Cadet use (Modern nomenclature: Model 1817 Artillery/ Cadet Musket). Smoothbore flintlock muzzleloader, 0.69 caliber, 36.00-inch barrel length. Only 200 of this pattern were known to have been produced in the early two-band version in 1817-1818. Only a few examples of these survive.

Model 1830 Cadet Musket. Smoothbore flintlock muzzleloader, 0.57 caliber. Quantity produced: 307; 154 with 36-inch and 153 with 40-inch barrel lengths. The first of the true "cadet" guns.

Model 1841 Cadet Musket. Smoothbore percussion muzzleloader, 0.57 caliber, 40.00-inch barrel length. Quantity produced: 504. The Model 1841 was the first percussion-fired cadet, and utilized the lock of the 1841 rifle.

Model 1847 Musketoon; Sapper or Cavalry, altered for Artillery/ Cadet use. Smoothbore percussion muzzleloader, 0.69 caliber, 26.00-inch barrel length. Quantity produced: 858 altered; 228 from Sappers and 630 from Cavalry.

Model 1851 Cadet Musket. Smoothbore percussion muzzleloader, 0.57 caliber, 40.00-inch barrel length. Quantity produced: 4,000; 323 of which were rifled and sighted in 1856-1857. Similar to the 1841 but with an 1847 musketoon lock.

Model 1858 Cadet Musket. Rifled percussion muzzleloader utilizing the Maynard tape priming system, 0.58 caliber, 38.00-inch barrel length. Quantity produced: 2,501 total; 1,501 Type I, with patchbox and 1855-style rear sights and 1,000 Type II, no patchbox and 1858-style rear sights. Very similar to the 1855 Rifle-Musket but with shorter barrel.

Model 1866 Cadet Rifle. Rifled breechloader, .50-55 cartridge, 33.00-inch barrel length. Quantity produced: 424. Modeled after the 1866 2nd Allin, it was made new and not from surplus parts. Unlike the 1869 Cadet Rifle to follow, it has a unique, dated "1866" breechblock and thinner, dated "1867" lockplate.

Model 1867 Navy Cadet Rolling Block Rifle. Rifled breechloader, .50-45 cartridge, 32.56-inch barrel length. Quantity produced: 498. Made for the U.S. Naval Academy, it utilized the Remington rolling block action.

Model 1869 Cadet Rifle. Rifled breechloader, .50-55 cartridge (.50-70 chambering), 29.60-inch barrel length. Quantity produced: 3,422. Similar in appearance to the Model 1866 Cadet Rifle except it utilizes the repurposed, full-size 1863-64 dated locks and the breechblock is the same as the Model 1868 Rifle.

Models 1873 and 1884 Cadet Rifles. Rifled breechloader, .45-55 cartridge (.45-70 chambering), 29.60-inch barrel length. Quantity produced: approximately 22,000; Model 1873, 9,594;
Model 1884, 12,500. Four discrete rear sight models tend to erroneously define four separate cadet (and rifle) models in modern parlance.

Appendix I1

COMPARISONS OF CADET FIREARMS WITH THEIR PARENT FIREARM[12.]

Cadet Firearm	Parent Firearm[3]	Type Firing & Loading	Cadet Firearm Caliber & Bore	Parent Firearm Caliber & Bore	Cadet Firearm Overall Length	Parent Firearm Overall Length	Cadet Firearm Over-all Length w/Bayonet	Parent Firearm Over-all Length w/Bayonet	Cadet Firearm Weight (approx.)	Parent Firearm Weight (approx.)
1795 Charleville Pattern 33" bbl.	Charleville Pattern Musket	Flintlock Muzzleloader	0.69 Smoothbore	0.69 Smoothbore	47.06	59.50	61.56	74.00	7.8	9.2
1807 Carbine for Indians	Charleville Pattern Musket	Flintlock Muzzleloader	0.54 Smoothbore	0.69 Smoothbore	48.56	59.50	63.06	74.00	6.6	9.2
1817 Short Musket 36"bbl.	1816 Musket	Flintlock Muzzleloader	0.69 Smoothbore	0.69 Smoothbore	51.63	57.50	66.50	74.43	9.1	9.9
1830 Cadet	1816 Musket	Flintlock Muzzleloader	0.57 Smoothbore	0.69 Smoothbore	51.50 55.25	57.50	66.69 71.19	74.43	6.8 7.1	9.9
1841 Cadet	1842 Musket	Percussion Muzzleloader	0.57 Smoothbore	0.69 Smoothbore	55.25	57.75	69.75	76.63	7.0	9.0
1847 Musketoon	1842 Musket	Percussion Muzzleloader	0.69 Smoothbore	0.69 Smoothbore	41.06	57.75	55.94	76.63	7.0	9.0
1851 Cadet	1842 Musket	Percussion Muzzleloader	0.57 Smoothbore & Rifled	0.69 Smoothbore	55.13	57.75	69.63	76.63	7.4	9.0
1858 Cadet	1855 Rifle-Musket	Percussion Muzzleloader	0.58 Rifled	0.58 Rifled	53.13	55.94	70.00	74.63	7.8	9.2
1866 Cadet	1866 Rifle 2nd Allin	Cartridge Breechloader	0.50-55[4] Rifled	0.50-70 Rifled	48.00	55.88	64.25	74.56	7.4	9.6
1867 Navy Cadet	1861 Whitney Contract Navy[5]	Cartridge Breechloader	0.50-45 Rifled	0.69 Rifled	47.38	50.25	63.63	72.50	8.0	9.6
1869 Navy Cadet	1868 Rifle	Cartridge Breechloader	0.50-55 Rifled	0.69-70 Rifled	49.00	52.00	65.25	70.69	8.0	9.2
1873/1884 Cadet	1873/1884 Rifle	Cartridge Breechloader	0.45-55 Rifled	0.45-70 Rifled	49.18	52.00	65.43	70.69	8.2	9.2

1. The following dimensions are not taken from statistically significant samples, but rather, are single data points taken from the author's collection. They are shown here to illustrate the relative difference between the cadet and its parent, and not intended as a definitive metric.
2. All dimensions are in inches or pounds.
3. The Parent Firearm is the standard infantry arm of the day that a cadet might otherwise be carrying, not necessarily the firearm after which the Cadet gun was modeled.
4. All Cadet "trapdoors" were chambered for either .50-70 or .45-70, but the front sights were approximately 0.050 inches shorter to compensate for the lighter 55 grain loads.
5. The US Navy did not have a firearm that could be considered a "standard" by which to compare. The Whitney-Plymouth contract of 10,000 arms is a reasonable choice for this comparison.

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